AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 6302

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STEEL, LOW ALLOY HEAT RESISTANT
1.25Cr - 0.65Si - 0.5Mo - 0.25V (0.28-0.33C)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. FORM: Bars, forgings, and forging stock.

3. APPLICATION: Primarily for turbine and compressor wheels and bolts for use at temperatures up to 1000 F.

4. COMPOSITION:

		Check Analysis Under Min or Over Max	
Carbon	0.28 - 0.33	0.02	0.02
Manganese	0.45 - 0.65	0.03	0.03
Silicon	0.55 - 0.75	0.05	0.05
Phosphours	0.040 max	--	0.005
Sulfur	0.040 max	--	0.005
Chromium	1.00 - 1.50	0.05	0.05
Molybdenum	0.40 - 0.60	0.03	0.03
Vanadium	0.20 - 0.30	0.03	0.03

5. CONDITION:

5.1 Bars: In a machinable condition having hardness not higher than Brinell 241 or equivalent, except that, if ordered cold finished, hardness may be as high as Brinell 248 or equivalent.

5.2 Forgings: Unless otherwise ordered, annealed having hardness not higher that Brinell 241 or equivalent.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Bars and Forging Stock: Test specimens shall be capable of meeting the following requirements:

6.1.1 Test Specimens: Test specimens, before heat treatment, shall be not less than 4 in. long and have full cross section.

6.1.2 Heat Treatment: Heat to 1750 F ± 15, hold at heat for 1 hr and cool in still air, then heat to 1100 F ± 10, hold at heat for 6 hr and air cool.

6.1.3 Hardness: The hardness at the center of the test specimen after the above heat treatment shall be not lower than Brinell 331 for sections 2 in. and under and not lower than Brinell 302 for larger sections.

6.2 Grain Size: Five or finer, ASTM E19, Method a. A heat of steel predominantly five or finer with grains as large as three is permissible.

6.3 Decarburization:

6.3.1 Bars ordered ground, turned, or polished shall be free from decarburization.

6.3.2 Allowable decarburization of bars ordered for redrawing or forging, or to specified microstructural requirements, shall be as agreed upon by purchaser and vendor.

6.3.3 Decarburization of bars to which 6.3.1 or 6.3.2 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Paralled Sides Inches	Depth of Decarburization Inch
0.375 and under	0.015
Over 0.375 to 0.500, incl	0.017
Over 0.500 to 0.625, incl	0.019
Over 0.625 to 1.000, incl	0.022
Over 1.000 to 1.500, incl	0.025
Over 1.500 to 2.000, incl	0.030
Over 2.000 to 2.500, incl	0.035
Over 2.500 to 3.000, incl	0.040
Over 3.000 to 4.000, incl	0.045

6.3.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by the microscopic method, or by Rockwell Superficial 30-N scale hardness method, or equivalent hardness testing method, on hardened specimens. Depth of decarburization, when measured by hardness method, is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

6.3.4.1 When determining the depth of decarburization, it is permissible to disregard local areas provided the decarburization of such areas does not exceed the above limits by more than 0.005 in. and the width is 0.065 in. or less.

7. QUALITY: Steel shall be aircraft quality. It shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2251 as applicable. Diameter or thickness tolerances for cold finished bars and all hexagons shall conform to Table I, column headed "over 0.28 to 0.55 incl".